



NAREL ANALYTICAL REQUEST FORM

This form must be completed at least 14 days before sending any samples to NAREL for analysis. The requester is to complete all fields highlighted in BLUE and e-mail the form to Tonya Hudson ([HYPERLINK "mailto:HUDSON.TONYA@EPA.GOV"]) along with an electronic copy of the project's QA Plan and detailed site and project description (required).

Requester:	Wayne Praskins	Request Date:9/15/20 (updated 3/23/21)
Title:	Remedial Project Manager	Office/Region: Region 9
Address	75 Hawthorne Street SFD-7-3, San Francisco, CA 94105	
Phone:	415-972-3181	FAX: not used
E-mail:	Praskins.wayne@epa.gov	
List all who are to receive data reports in addition to the requester:	[HYPERLINK "mailto:Karla.Brasaemle@TechLawInc.com"]; norm.gillen@adanta-inc.com	

PROJECT INFORMATION

The Hunters Point Naval Shipyard Superfund Site in San Francisco, California, was home to a shipyard from 1945 to 1974 and the Naval Radiological Defense Laboratory (NRDL) from 1948 to 1969. Efforts to decontaminate and remediate contaminated soils, buildings, and other media at the 934 acre site have been underway since at least the 1960s .

Site activities included the decontamination of radiologically contaminated ships from atomic bomb testing in the Pacific ("Operation Crossroads") and research on the effects of radiation on living organisms and natural and synthetic materials. A wide variety of radionuclides were used at the site and may have been released to the environment.

In 2018 two Navy contractor employees were sentenced to prison time for falsifying sampling data and other practices that raised concerns about the reliability of investigation and remediation work conducted by the contractor. The Navy has begun a multi-year effort to collect and analyze soil samples in locations where the existing data are considered unreliable. EPA will be collecting split samples at a frequency of about 2.5%. The radionuclides of concern include Am-241, Co-60, Cs-137, Eu-152, Eu-154, Tritium, Pu-239, Ra-226, Sr-90, Th-232, and U-235.

Site Name and Location: Hunters Point Naval Shipyard Superfund Site, San Francisco, CA

Site Program Type: [FORMCHECKBOX] Regional [FORMCHECKBOX] Superfund [FORMCHECKBOX] Other _Federal Facility

Expected Arrival Date at NAREL: Beginning late September or early October 2020, then additional shipments once or twice per month

Does Project Have a QAPP: Yes [FORMCHECKBOX] No [FORMCHECKBOX]

Number of Samples and Matrices:	Soil	Sediment	Water	Air Filter	Vegetation	Other
	Est 20-35 per month	[FORMTEXT]	[FORMTEXT]	[FORMTEXT]	[FORMTEXT]	[FORMTEXT]

PROJECT SPECIFIC REQUIREMENTS

NAREL standards for preparation, QC, TAT, data reporting, and MQOs can be found on pages 2 through 4.

For requirements other than NAREL standards, an Analytical Protocol Specification (APS) form must be completed.

Specialized Handling:[FORMCHECKBOX] Radiochemicals [FORMCHECKBOX] Hazardous Chemicals [FORMCHECKBOX] Biohazards [FORMCHECKBOX] Other _[FORMTEXT]_

Sample Preparation: [FORMCHECKBOX] NAREL Standard [FORMCHECKBOX] Other [FORMTEXT]			
Quality Control: [FORMCHECKBOX] NAREL Standard [FORMCHECKBOX] Other [FORMTEXT]			
Turnaround Time: [FORMCHECKBOX] NAREL Standard [FORMCHECKBOX] Other [FORMTEXT]			
Data Reporting: [FORMCHECKBOX] NAREL Standard [FORMCHECKBOX] Other [FORMTEXT]			
MQOs: [FORMCHECKBOX] NAREL Standard [FORMCHECKBOX] Other [FORMTEXT]			
NAREL ANALYTICAL SERVICES			
Analysis	Check Box	Analysis	Check Box
Gamma Spectrometry	[FORMCHECKBOX]	Americium	[FORMCHECKBOX]
Gamma Spectrometry (21-day ingrowth)	[FORMCHECKBOX]	Plutonium	[FORMCHECKBOX]
Gross Alpha/Beta	[FORMCHECKBOX]	Uranium	[FORMCHECKBOX]
Tritium (water only)	[FORMCHECKBOX]	Thorium	[FORMCHECKBOX]
Iodine-131 (water only)	[FORMCHECKBOX]	Radium-226	[FORMCHECKBOX]
Strontium (water only)	[FORMCHECKBOX]	Radium-228 (by gamma)	[FORMCHECKBOX]

NAREL STANDARD SAMPLE PREPARATION
<p>Liquid samples are checked for pH and adjusted if necessary. Otherwise liquid samples are analyzed as received.</p> <p>Solid samples are dried and ashed for all analyses except gamma which uses the dried portion. If only gamma and gross alpha and beta analyses are requested, then samples are only dried for analysis. Foreign materials such as rocks, sticks, leaves, etc. are removed before ashing.</p> <p>Filter preparation is based on filter type, size, and requested analysis. Filters may be analyzed as received or may be dissolved prior to analysis.</p>
NAREL STANDARD QUALITY CONTROL INFORMATION

Standard QC analyses at NAREL are performed on batches of up to 20 samples of similar matrices. The QC analyses include:

Method	Method blank	LCS	Replicates	Matrix spike
Gross α/β for air filters			X	
Gross α/β for water	X	X	X	X
Gross α/β for other matrices	X	X	X	
Gamma-ray spectrometry	X	X	X	
Tritium in water	X	X	X	X
Actinides	X	X	X	
Radium-226	X	X	X	
Strontium	X	X	X	
Iodine-131	X	X	X	

Note: For analyses requiring duplicate (replicate) and matrix spike analyses, a sufficient amount of sample must be received. The sample-duplicate combination and the sample-matrix spike combination can be performed on two different samples, e.g., one will be split and duplicated, the second will be split and spiked, or on one sample if at least three volumes of sample are received.

NAREL STANDARD TURNAROUND TIMES

Turnaround time for all analyses except Radium-226 is 60 calendar days from receipt of sample(s) unless other arrangements are made before NAREL accepts the project. Radium-226 may require 10 *additional* days to complete.

Large numbers of samples, especially soil or solids, received at the same time may require longer turnaround times due to the sample prep required before analysis.

NAREL STANDARD DATA REPORTING

The NAREL standard data deliverable includes sample and QC results. Results will be reported as pCi/g (dry) for solids, pCi/L for liquids, and pCi/m³ for air filters. An electronic file (pdf) of the data report will be sent to the requester along with an electronic data deliverable (EDD). A hard copy of the report is available upon request.

NAREL STANDARD SAMPLE DISPOSAL

NAREL will dispose of liquid samples and return solid samples to the requester six months after delivery of the data package(s).

NAREL Standard MQOs for Routine Analyses

Analyte	Matrix	Aliquot	Count Time	Method	MDC	MQC	Unit
<i>Gamma-Ray Spectrometry</i>							
^{134}Cs	water	1 L	1000	GAM-01	4.5	TBD*	pCi/L
	solids	600 g	1000	GAM-01	0.011	TBD	pCi/g
^{137}Cs ($^{137\text{m}}\text{Ba}$)	water	1 L	1000	GAM-01	4.4	TBD	pCi/L
	solids	600 g	1000	GAM-01	0.011	TBD	pCi/g
^{60}Co	water	1 L	1000	GAM-01	4.1	TBD	pCi/L
	solids	600 g	1000	GAM-01	0.011	TBD	pCi/g
^{131}I	water	1 L	1000	GAM-01	6.0	TBD	pCi/L
	solids	600 g	1000	GAM-01	0.015	TBD	pCi/g
^{228}Ra (^{228}Ac)	water	1 L	1000	GAM-01	15	TBD	pCi/L
	solids	600 g	1000	GAM-01	0.037	TBD	pCi/g
<i>Gas Proportional Counting</i>							
Gross Alpha [†]	potable water	100 mL	100	GR-01	3.5	n/a [†]	pCi/L
	water (other)	50 mL	100	GR-01	8.2	n/a [†]	pCi/L
	solids	0.1 g	100	GR-03	4.1	n/a [†]	pCi/g
Gross Beta [†]	potable water	100 mL	100	GR-01	3.0	35	pCi/L
	water (other)	50 mL	100	GR-01	7.1	76	pCi/L
	solids	0.1 g	100	GR-03	3.5	38	pCi/g
	air filter	2500 m ³	20	AIRBETA	0.00073	0.0035	pCi/m ³
^{131}I	water	2 L	1000	I-01	1.2	5.2	pCi/L
$^{89}\text{Sr}^{\dagger}$	water	1 L	100	SR-05-EC (iso)	3.8	32	pCi/L
$^{90}\text{Sr}^{\dagger}$	water	1 L	100	SR-05-EC (iso)	1.7	12.5	pCi/L
^{90}Sr	water	1 L	100	SR-05-EC (total)	0.60	3.6	pCi/L
<i>Alpha-Particle Spectrometry</i>							
^{241}Am	water	200 mL	1000	ACT-01	0.40	5.3	pCi/L
	solids	0.5 g	1000	ACT-01	0.16	2.5	pCi/g
$^{243/244}\text{Cm}$	water	200 mL	1000	CM-01	0.40	5.3	pCi/L
^{238}Pu , $^{239/240}\text{Pu}$	water	200 mL	1000	ACT-01	0.40	5.3	pCi/L
	solids	1 g	1000	ACT-02F	0.08	1.2	pCi/g
^{226}Ra	water	200 mL	1000	RA-06-EC	0.47	5.5	pCi/L
	solids	0.25 g	1000	RA-06-EC	0.38	5.9	pCi/g
^{234}U , ^{238}U	water	200 mL	1000	ACT-01	0.47	5.5	pCi/L
	solids	1 g	1000	ACT-02F	0.10	1.2	pCi/g

Analyte	Matrix	Aliquot	Count Time	Method	MDC	MQC	Unit
²³⁵ U	water	200 mL	1000	ACT-01	0.56	n/a [†]	pCi/L
	solids	1 g	1000	ACT-02F	0.12	n/a [†]	pCi/g
²³⁰ Th	water	200 mL	1000	ACT-01	0.56	5.6	pCi/L
	solids	1 g	1000	ACT-02F	0.14	1.2	pCi/g
²³² Th	water	200 mL	1000	ACT-01	0.47	5.5	pCi/L
	solids	1 g	1000	ACT-02F	0.10	1.2	pCi/g
<i>Liquid Scintillation Counting</i>							
Tritium, ³ H	water	60 mL [§]	100	H-02	0.18	0.66	nCi/L

* TBD = To be determined

[†] In gross alpha-beta analyses and isotopic strontium analyses, each of the analytes interferes with the measurement of the other. The estimated MDC and MQC here are based on the assumption that only one analyte is present.

[‡] The relative standard uncertainty for this measurand is always greater than 10 %.

[§] The final volume of sample after preparation for tritium analysis is 10 mL.

NOTE: Despite the large values for the MDCs and MQCs for gross alpha and beta in potable water, NAREL can meet the “detection limits” required in CFR 141.25 for gross alpha (3 pCi/L) and gross beta (4 pCi/L) as long as the dissolved solids do not exceed 750 mg /L.

Analytical Protocol Specification (APS)

Please complete the APS for any project specific requirements where the NAREL standards listed above do not meet those required by the project's QA plan. More than one APS may be necessary to cover all requirements. NAREL will respond if requirements cannot be met by offering alternatives to the requirements which will be described on an Analytical Protocol Specification Alternate Proposal (APSAP) form and attached to the Project Acceptance Form (PAF). The PAF and any APSAP forms will be sent to the requester for signatures indicating acceptance of the data delivery dates and any proposed alternatives.

Site/Project Name: _____

Analyte list: _____ Analysis restrictions: _____

Matrix: _____ Possible interferences: _____

Concentration range: _____ Action level: _____

MQOs

Analytical QC

Batch size: <input type="checkbox"/> 20 samples <input type="checkbox"/> Other _____		
QC Sample Type	Frequency	Evaluation Criteria
<input type="checkbox"/> Method blank		
<input type="checkbox"/> Duplicate		
<input type="checkbox"/> Laboratory control sample		
<input type="checkbox"/> Matrix spike		
<input type="checkbox"/> Matrix spike duplicate		

Analytical Process Requirements

Activity	Special Requirements
Sample receipt and inspection	
Laboratory sample preparation	
Sample dissolution	
Chemical separations	
Preparing sources for counting	
Nuclear counting	
Data reduction and reporting	
Sample disposal	
Other	

Turnaround Time Requirements

Analysis	Special Requirements

Other requirement not listed above: _____

Requester's signature: _____ Date: _____

NAREL SAMPLE SHIPMENT GUIDELINES

This document provides guidance in the shipment of environmental samples to NAREL for radiochemical analyses.

All shipments must comply with the requirements of current DOT regulations. Refer to the DOT Hazardous Materials Regulations contained in Title 49 CFR Subtitle B, Chapter 1, Subchapter C, Parts 171 through 180.

Before collecting samples, please refer to the attached table for requested sample sizes, containers and preservatives. For matrices not listed, contact the NAREL Analytical Services Coordinator at (334)270-3433.

Before shipping samples, notify the NAREL Analytical Services Coordinator at (334)270-3433 and arrange for sample receipt and subsequent sample return 6 months after results have been reported.

When packing samples for shipment:

- Tape all container lids to the container, preferably with electrical tape.
- Seal individual samples in plastic bags, preferably ziplock bags.
- Use the correct amount of absorbent material for the volume present. Approved absorbent materials include vermiculite and cat litter.
- Ice is not required for radiochemical analyses, however, if vegetables, fruit, fish, or similar matrices are shipped, ice is required to maintain the integrity of the samples. If possible, maintain the temperature of samples requiring refrigeration during transport at or below 6°C. Ice in a sealed plastic bag or reusable ice substitute freeze packs are acceptable cooling media.
- Chain of Custody forms MUST be sealed in a large ziplock bag and taped to the inside of the cooler lid.

After samples are packed for shipment, secure the cooler with strapping tape and attach a custody seal (if available) across the seam of the cooler lid.

All samples MUST be shipped overnight to arrive Monday through Friday. No deliveries are accepted on weekends or Federal holidays.

Send all samples to:

**Tonya Hudson
Analytical Services Coordinator
National Analytical Radiation Environmental Laboratory
540 South Morris Avenue
Montgomery, Alabama 36115
(334) 270-3433**

SAMPLE COLLECTION AND ANALYSIS INFORMATION

	Water Samples				Soil / Sediment Samples			
Analysis	Collection Volume	Acceptable Containers	Preservative	Holding Times	Collection Volume (g)	Acceptable Containers	Preservative	Holding Times
Tritium	200 mL	Preferably glass bottles with Teflon lined caps, but plastic bottles are an acceptable alternative.	None NO ACID	NA				
Other Radiochemical Analyses	4 L*	Plastic	HNO ₃ to pH <2	NA	~ 650 g	Preferably ziplock bags, but plastic containers are an acceptable alternative.	None	NA

* If multiple analyses are requested, please provide sufficient volume (preferably 3.0 L) to allow for a dedicated gamma analysis aliquot.
Call the Analytical Services Coordinator at 334-270-3433 for further instructions if needed.